NEAR-INFRARED SPECTROSCOPY OF SIMPLE ORGANIC MOLECULES IN THE GV TAU N PROTOPLANETARY DISK

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T Tauri stars are low mass young stars that may serve as analogs to the early solar system. Observations of organic molecules in the protoplanetary disks surrounding T Tauri stars are important for characterizing the chemical and physical processes that lead to planet formation. We used NIRSPEC on Keck 2 to perform a high resolution ($\lambda/\Delta\lambda \sim$ 25,000) L-band survey of T Tauri star GV Tau N, a nearly edge-on young star in the L1524 molecular cloud. The nearly edge-on orientation is rare but necessary to sample the disk in absorption, rather than the more common emission line measurements. GV Tau N is one of only two sources for which HCN and C_2H_2 have been reported in absorption (Gibb et al. 2007; Doppmann et al. 2008). More recently, we reported the first detection of methane, CH_4 (Gibb & Horne 2013). The rotational temperatures are relatively high, implying that HCN, C_2H_2, CH_4, and water originate in the warm molecular layer of the inner protoplanetary disk. Differences in rotational temperature for different molecules suggest that the absorbing column for each molecule samples a different radial distribution.

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